BAYOU LAFOURCHE FRESHWATER DIVERSION PROJECT
October 25, 2001

Status of seven directives issued at the April 12, 2001, Task Force Meeting:

1. Investigate the impact of water supply uses on wetland benefits. EPA has studied the water supply users of Bayou Lafourche and found that on average about 42 cfs is withdrawn from the bayou. Over the next 20 years, the projected increase is 25%, or about 52 cfs. During sugar cane grinding season (approx. 90 days in the late fall), a total of 110 cfs is withdrawn, with a 25% increase projected over the next 20 years, or 136 cfs. This information has been provided to the Benefits Workgroup for a determination of how these withdrawals would effect projected wetland benefits of the project.

2. Review the project benefits and likelihood of achieving success.
On May 2, 2001, a Benefits Work Group made up of agency and academic representatives met at the EPA office in Baton Rouge to begin discussions about what type of information would be needed to determine if a re-evaluation of the wetland benefits is necessary. Following several additional meetings, their findings were presented to the Environmental and Engineering Work Groups on September 6, 2001, along with an analysis of the UNET model, future water usage, and the application of monitoring data from the Caernarvon Freshwater Diversion Project and the West Point a la Hache Diversion. The group agreed that the previous UNET model runs, conducted by the Corps in 1998, provide an adequate tool for determining the distribution and volume of flow for each outlet in the study area. The group also agreed that no new information is available which would significantly change the assumptions or the projection of benefits made for the 1998 WVA. Therefore, the Environmental and Engineering Work Groups unanimously determined that a new evaluation of the benefits of the Bayou Lafourche Diversion Project is not warranted at this time (see Attachment 1, Environmental Work Group summary). The WVA calculation of AAHU benefits is 705.

3. Briefly consider measures and alternatives to reduce costs. In July, 2001, the Corps of Engineers completed a Value Engineering Team Study to examine alternatives to reduce project costs. The alternatives primarily consisted of engineering design alternatives, but limited consideration was given to improving cost effectiveness via other funding mechanisms or cost share partners. The final report, *Bayou Lafourche Siphon Restoration Project Southern Louisiana,* was distributed to the Task Force members at the Technical Committee meeting on July 24, 2001. The Engineering Work Group reviewed and commented on this report during September, 2001. The Work Group members overwhelmingly believe the report provides some viable cost saving alternatives. However, there were questions raised about the potential benefits for some of the alternatives.

   For that reason, EPA conducted a general ecological overview of the C-1 and C-3 alternatives of supplying some flow from the Mississippi River (200 cfs or 750 cfs, respectively), along with 800cfs from the Company Canal. This analysis revealed that the

proposed design may shift a very small amount of ecological benefits already accounted for by the Davis Pond project to the benefitted area of the proposed Bayou Lafourche alternative. The most significant question, however, is whether the quality of the water diverted through Company Canal to Bayou Lafourche would be of a similar quality as that coming directly from the Mississippi River. Currently, water quality modeling data to address this issue is limited and expert opinions differ. In the absence of water quality data from Company Canal during operation of the Davis Pond structure, ecological benefits can only be speculated. However, a number of concerns have been voiced about the potential for adverse water quality effects from water discharged into Bayou Lafourche from the Company Canal under alternatives C-1 and C-3. Further study of water quality issues will be conducted as a part of the NEPA process.

4. Investigate alternative funding sources and their requirements. The Value Engineering report addresses certain alternative funding methods for selected portions of the project in the "Value Engineering Comments" section of the report. Examples included pursuing partial funding under Section 219 of WRDA, obtaining flowage easements or dredging costs from local sponsors, and apportioning out some costs related to freshwater supply. In addition, the 1998 EPA Summary Report, *Evaluation of Bayou Lafourche Wetlands Restoration Project*, found that any financial contributions by others which reduce the projected O&M component of the project budget will have a disproportionate effect in reducing the estimate of CWPPRA costs. Overall, cost-sharing has the potential to substantially improve the cost-effectiveness of the project.

   Another option would be to secure funding through the Corps of Engineers' environmental infrastructure authorization (75% federal, 25% non-federal cost share).

5. Review other planned public works and how they impact the project. The Benefits Work Group, as well as the Value Engineering Team Study reviewed other planned public works and how they might impact the project. In particular, potential impacts of the Davis Pond Diversion and influence from Atchafalaya River flows were addressed by the Environmental Work Group in determining the most appropriate boundary conditions to use in the UNET model. However, further analyses of project interactions should be conducted as part of the Phase 1 Engineering and Design work, considering the likelihood of other projects being implemented such as the proposed lock on the Houma Navigation Canal, the proposed lock at Golden Meadow on Bayou Lafourche, and a salinity control structure on Company Canal west of Bayou Lafourche.

6. Provide pros and cons on options for proceeding with Phase 1. The Benefits Work Group effort has been completed and the Engineering Work Group has completed a review of the Value Engineering study. No additional work is recommended at this point regarding benefits analyses. The Phase 1 Engineering and Design effort would include additional alternatives analyses, as well as additional consideration of the ecological effects of the Bayou Lafourche diversion with the operation of related hydrologic features such as Davis Pond. Proceeding with Phase 1 studies would provide more specific information on design options, costs, and construction schedules.

7. Determine the recommended level of CWPPRA investment in the project. In conjunction with the review of pros and cons of proceeding with Phase 1, CWPPRA partners have worked together to recommend a level of CWPPRA investment to the Task Force. The State Wetlands Authority unanimously passed a resolution approving and authorizing 50% of the estimated cost of the Engineering and Design phase, subject to several conditions including a decision to proceed at the 30% design review point. Based on these considerations, it is the EPA recommendation that the CWPPRA Task Force approve funding for 50% of the estimated Phase 1 cost of $9.7 million for the Bayou Lafourche diversion project.

Attachment 1:

Bayou Lafourche Diversion Project - Year 2001 Environmental Work Group Evaluation

At the April Task Force meeting, guidance was given to the Technical Committee to investigate certain aspects of the Bayou Lafourche Diversion Project. The Technical Committee then requested that the Environmental Work Group complete two tasks:

> 1) Investigate the Impact of Water Supply Uses on Wetland Benefits - Present a short analysis of water supply uses in Bayou Lafourche and the impacts on the wetland benefits that have been attributed to this project. The analysis should include a projection of future water supply demands.
>
> 2) Review Project Benefits and Determine the Likelihood of Success - Re-evaluate the benefits associated with the 1998 evaluation and verify the assumptions made concerning the UNET model used to determine the benefitted areas. Determine if a re-evaluation of the benefits is necessary.

On May 2, 2001, agency and academic representatives met at the EPA office in Baton Rouge to discuss what type of information would be needed to determine if a re-evaluation of the wetland benefits is necessary. During that meeting, it was decided that three main issues should be investigated: 1) the impact of future water withdrawal on the wetland benefits; 2) use of the UNET model, during the 1998 evaluation, to determine benefitted areas and flow distribution; and 3) monitoring data from the Caernarvon Freshwater Diversion Project should be utilized to assist in determining project benefits. That information and associated analyses would be presented to the Environmental and Engineering Work Groups to determine if a re-evaluation of the benefits is necessary or if the 1998 evaluation is adequate.

That information was presented to the Environmental and Engineering Work Groups on September 6, 2001. Kevin Roy presented a brief overview of the task assigned by the Technical Committee and the major issues which were investigated. Dr. Jenneke Visser presented the results of the investigation of the UNET model, future water usage, and the application of monitoring data from the Caernarvon Freshwater Diversion Project and the West Point a la Hache Diversion.

One concern regarding the UNET model was that the 1998 model run used for the WVA did not consider the input of the Davis Pond Freshwater Diversion. However, several model runs were conducted for the 1998 evaluation allowing different boundary conditions to be selected. New flow volumes for each outlet were calculated from a model run which incorporated the influence of the Davis Pond Diversion to more closely represent future conditions in the Barataria Basin. The new model run resulted in a somewhat different flow distribution in the project area. However, the group agreed that the revised flow distribution does not provide justification for a new evaluation and that no additional model runs are necessary for this Phase 0 evaluation.

The group agreed that the previous UNET model runs conducted by the Corps in 1998 provide an adequate tool for determining the distribution and volume of flow for each outlet in the study area. Although the model was run in steady state (i.e., no affect of winds, tides, or storage at the outlets), the group agreed that it adequately projects flow distribution under average conditions and is a useful tool for projecting benefits.

Water usage, both current average annual uptake and future increased uptake, were incorporated into this evaluation and factored into the UNET model results. Water usage data was provided by the Lafourche Freshwater District. That information was also factored into the 1998 evaluation.

An analysis was also conducted to determine the nutrient availability to marshes influenced by the Bayou Lafourche Diversion. That analysis involved two main issues: 1) potential suspended sediment concentrations in the Bayou Lafourche channel and its affect on algal blooms and 2) the denitrification potential of the Bayou Lafourche channel. Conclusions from that investigation are: 1) suspended sediment concentrations in the channel would be sufficient to prevent the occurrence of algal blooms which could result in nutrient uptake and 2) denitrification in the Bayou Lafourche channel from Donaldsonville to Larose would be minimal. The conclusion is that nutrients introduced at Donaldsonville would be not be significantly taken up before reaching project area marshes. Nutrient availability was also considered in projecting benefits during the 1998 evaluation.

Nutrient and plant biomass data from the Caernarvon Freshwater Diversion Project and West Point a la Hache Diversion were analyzed to determine a potential benefitted area for the Bayou Lafourche Diversion. That analysis focused on the relationship between nutrient levels, plant biomass, and distance from the diversion site. The conclusion from that analysis is that a potential benefitted area of 60,000 acres could be expected from a similar freshwater diversion project.

The potential effects of a 1,000 cfs diversion on salinity were also projected based on a conversion of that amount of water to annual rainfall (approximately 6 inches) and the corresponding isohaline movement. The conclusion from that analysis is that the projected isohaline movement would potentially impact approximately 100,000 acres.

Based on the above projections for a potential benefitted area, the projection of 85,000 benefitted acres estimated in the 1998 WVA appears to be a reasonable estimate.

The group would also like to point out several important issues which were discussed during our meeting.

1) The UNET model utilized for this evaluation was run in steady state without the effects of wind, tides, or the storage capacity at each outlet. Incorporating the effects of those variables, while providing a more accurate measure of flow distribution, would provide additional information for determining the success of this project in achieving its wetland benefits. However, incorporating those additional variables would be very costly and time-consuming and are not necessary the level of evaluation during Phase 0. Such an exercise would be necessary during the Phase 1 investigation.

2) The group recognizes that certain benefits of this project are not quantified by our evaluation methodology (i.e., WVA). Water quality benefits and benefits to freshwater fisheries would occur as a result of this project but are not quantified during our evaluation of CWPPRA restoration projects. Many restoration projects provide secondary benefits (e.g., storm surge protection, improved water quality, habitat for threatened and endangered species) which are not quantified during Phase 0 evaluations. Many secondary benefits are captured using the Coast 2050 Criteria and other selection criteria including Longevity/Sustainability. However, the Environmental Work Group would like to ensure that the Task Force is aware of the secondary benefits of the Bayou Lafourche Diversion which can be discussed qualitatively.

The Environmental Work Group and Academic Advisory Group agreed unanimously that a new evaluation of the benefits of the Bayou Lafourche Diversion Project is not necessary. The information presented above verifies many of the assumptions made during the 1998 evaluation. Furthermore, the new information presented, primarily the preliminary data from the Caernarvon Pulses Study, does not provide sufficient grounds for conducting another evaluation. No new information is available which would significantly change the assumptions or the projection of benefits made for the 1998 WVA. It is our recommendation that another evaluation not be conducted.

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